

Date: Sat, 5 Nov 94 04:30:37 PST
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: List
Subject: Ham-Homebrew Digest V94 #326
To: Ham-Homebrew

Ham-Homebrew Digest Sat, 5 Nov 94 Volume 94 : Issue 326

Today's Topics:

 Communications Quarterly
 FM Crystal Set
 Intermod Help!
 PCB Board from laser print?? (3 msgs)
Periodic Announcement - ARRL Email Information Server (info@arrl.org)
 Quad Op Amp ??
 VCO in Key Components of Mod RCVR Design (QST)
 Video Id'er . need info.
 Where can I find a grid dip meter? (2 msgs)
 Where does the power go

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Wed, 2 Nov 1994 19:17:50 GMT
From: mcross@cv.hp.com (Minor_Cross)
Subject: Communications Quarterly

Ralf Gregory (TFG073@email.mot.com) wrote:
: I recently found "Communications Quaterly" referenced in an
: technical article.
: What type of journal is it ? Where can I get it and what is the
: price?

Communications Quarterly is a publication of CQ Communications, Inc.
76 North Broadway Hicksville, NY 11801

Subscriptions are \$29.95 per year, two yrs for \$56.95 (USA)

73

Minor

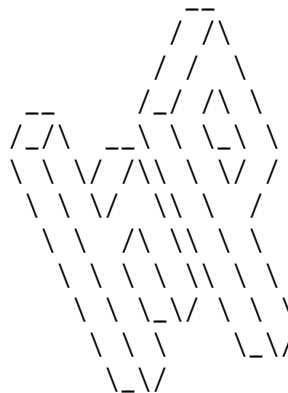
--

Insert Standard Disclaimer notice here:

Minor Cross KD7YJ

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Date: Sat, 5 Nov 94 03:12:00 -0400
From: hua.chu@channel11.com (Hua Chu)
Subject: FM Crystal Set

MA>Message-ID: <9410027838.AA783802842@mails.imed.com>
MA>Newsgroups: rec.radio.amateur.homebrew
MA>Organization: ucsd usenet gateway

MA>Ian Mitchell asked how the crystal set works in digest #323.

Could you please tell me how I can get this digest? To what address do I subscribe? Thanks for helping out a novice.

-H.C.

* OLX 2.1 * Every time I lose weight, it finds me again!

Date: Thu, 3 Nov 1994 18:05:00 GMT
From: tom.alldread@kbsbbs.com (Tom Alldread)
Subject: Intermod Help!

LB>I am running a Kenwood th-28a HT with a J-Pole antenna. My problem
LB>is that there is a cellular tower close to my current residence and
LB>my receiver is picking up extreme intermod. I am looking for any

LB>"cheap" or should I say "homebrew" way of filtering out the
LB>intermod... Any help would be appreciated.

Greetings Loren:

Fair Radio Sales in Lima, Ohio 419-223-2196 used to handle a
military surplus dual cavity bandpass filter F-194U that tuned 142-163
MHz. They also had models F-192U and F193U filters that could be
modified to cover the 2 M band. They were priced at less than \$30 US
plus shipping. I do not know if they still have these filters available.

73

Very Best Regards,
T.M. Alldread INTERNET: tom.alldread@kbsbbs.com

* CmpQwk #UNREG* UNREGISTERED EVALUATION COPY

Date: Thu, 3 Nov 1994 12:43:06 +0000
From: G3SEK@ifwtech.demon.co.uk (Ian G3SEK)
Subject: PCB Board from laser print??

In article: <1994Nov01.204639.125036@zeus.aix.calpoly.edu>
snorris@harp.aix.calpoly.edu (Sean
Norris) writes:

>

> I'm working on a project that requires me to make a PC board and I want
> it to be as hassle free as possible. I have seen many ads about some
> special paper which you can print with a laser printer, iron it onto the
> PC board, peel it off and then etch. Has anyone used this technique? If
> so, is it reliable? My project is all surface mount and at very high
> frequencies so the traces must be small and sharp.
> If anyone has any experience/tips/brands/etc. I would appreciate it very
> much if you could E-mail me.

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> frequencies so the traces must be small and sharp.
> If anyone has any experience/tips/brands/etc. I would appreciate it very

> much if you could E-mail me.

Please post any good ideas to this newsgroup - we'd all like to know!

One potential problem with laser printers is that they don't necessarily print with full geometric accuracy. For example, my old LJII clone is OK across the page but has errors of up to 5% along the length. This makes it very difficult to get the board mounting holes on the right centers, and the pins of VLSI ICs can drift out of alignment. Fortunately I know where the accurate zones are, so it's adequate for small boards.

Moral: print out a 1"x1" grid and check it all over the page.

--

73 from Ian G3SEK	Editor, _The_VHF/UHF_DX_Book_
Abingdon, England	
g3sek@ifwtech.demon.co.uk	"In Practice" columnist for RadCom (RSGB)

Date: Thu, 3 Nov 1994 18:56:17 GMT
From: tomb@lsid.hp.com (Tom Bruhns)
Subject: PCB Board from laser print??

Ian G3SEK (G3SEK@ifwtech.demon.co.uk) wrote:

(re: using a laser printer in making homebrew pc boards...)
: Please post any good ideas to this newsgroup - we'd all like to know!

Well, this isn't exactly what the original poster had in mind, but it works well for me. I make single and double sided boards, mostly surface mount now. Most of the parts I use are SOIC outlines with 50 mil lead spacing, 1206 and 0805 resistors and ceramic caps, tantalums, inductors, and things like that. Occasionally I'll do a fine-pitch part, though when doing that, I don't rely on just the laser printer.

My process is photographic. But it's pretty simple; from bare board to etched blank is about 1.5 hours, including coating the board with photoresist and drying it. No darkroom is required, just dim lighting. You can get pre-coated boards, too, to avoid dealing with the photoresist lacquer and save the coating and drying time, about 45 minutes.

I can provide more details on the resist and its application, but will emphasize exposure here:

I print a 1:1 flipped image of the design I want, with black where I want

copper on the board: a "positive" image. My photoresist is "positive" type. I print the image on a good quality tracing vellum. It's translucent, and by printing the image flipped, the toner goes against the board and keeps the light diffusion in the paper from messing up the image. The exposure is about 12 minutes under a sunlamp at about 15 inches, in a simple print frame made of a large sheet of 1/4" plate glass and an equal-size piece of foam rubber--it's about 15" square. Just a simple piece of plywood under it all to keep it flat. The weight of the glass against the board and paper, with the foam on the bottom of the board, keeps the paper against the board. After exposure, develop (in a dilute sodium hydroxide solution) for about 2 to 3 minutes--in dim light it's easy to see the development. Rinse, scrub gently with a moist sponge with a bit of cleanser (e.g., "Comet") on it. Float on top of a tray of ferric chloride to etch.

I have no trouble putting 8 mil traces/8 mil spaces on a board this way, so I can do a single trace between SOIC pins. I have done some 5mil/5mil stuff, but I print that 4:1 and have a litho shop make a 1:1 transparency for me for about \$10. A 600dpi laser printer might make 5/5 boards possible the "simple way." My strange etch method has a reason: as the etching takes place, convection currents are set up. Gentle though they are, they make the etching a bit faster and leave very clean edges that are more vertical than if I just put the board on the bottom of the tray. You can float a board through the wonder of surface tension. I was surprised to see how well it worked when I first tried it. -- I got a lot of ferric chloride a long time ago, and though it's not the ideal etchant, I'll use it till it's gone. I'll probably switch to cupric chloride when that happens.

For double-sided boards, I make two transparencies with alignment marks, and tape them along one edge. I then tape the board to one of the transparencies (which are quite a bit oversize) along two edges and lay the other transparency over the top of the board. That side is the first to be exposed; the board is flipped and exposed to the transparency it's taped to next. You can do better with alignment if you have a strip of material the thickness of the board that you can align the transparencies to, using perhaps pins through precision-punched holes like is done for things like architectural drawings that span several layers that must be kept in alignment. But using the simple tape-together method, I've used 30 mil pads on vias successfully, and with surface mount, there's never a need for anything but vias. Careful layout keeps those to a minimum.

Date: 4 Nov 1994 14:08:24 -0800
From: edbu@sepia.wv.tek.com (Ed Burress)
Subject: PCB Board from laser print??

In article <CynLH5.C74@sunsrvr6.cci.com> jdc@cci.com (James D. Cronin) writes:

> (stuff deleted)

>I've done toner transfer with regular paper and there are problems with
>the toner not sticking. There is paper with a water soluble coating that
>is said to work well.

>

>Anybody know what the paper is coated with?

>

>73...Jim N2VNO

>

>>Thanks,

>>Sean

>>

>

>

I have found that paper made for thermal wax transfer works well.
It has a clay coating which loosens up when placed in warm water.
I am soaking yet another batch for a Kenwood computer interface ala
QST Feb. '93 as we speak (read). The particular paper I use is for
the Tektronix Phaser 200/220 series printers, since I work for them as
a Media Engineer. I suspect that there are quite a few papers which
have a clay coating on the surface available at local paper supply
stores. Many of these will be for thermal wax transfer, or ink jet type.

As an alternative, I have heard of people having good success by coating
the paper with a diluted solution of elmers glue and allowing it to dry
before printing on it. I have not tried this, and don't really plan to
perform potentially terminal experiments on my laser printer. Good luck.

Ed Burress

KC7GFX

Date: Wed, 2 Nov 1994 21:00:02 MST

From: mtracy@arrl.org (Michael Tracy)

Subject: Periodic Announcement - ARRL Email Information Server (info@arrl.org)

Periodic Announcement - ARRL Email Information Server (info@arrl.org)

The services that the ARRL provides via the internet include the
Email Information Server and the Technical Information Service.
The Information Server is an automated mail server that gives you
access to many of information files relating to various facets of
Amateur Radio. You can retrieve any or all of these files by
sending an email message to info@arrl.org here at ARRL HQ.

Each file you request is then mailed to you automatically.

To use it, mail messages to:

info@arrl.org

Each line of the message body should contain a command as shown below. The subject of your message is not processed and may be omitted. You may place as many commands in a message as you want. The files you request will be sent to you in separate messages. Only ASCII text files are supported.

Valid INFO commands:

```
reply <address> (may be needed - see below for explanation)
help
index
send FILENAME (example: send prospect.txt)
quit
```

In the above message example, "help" retrieves a brief set of instructions for info, "index" retrieves a list of available files and "send prospect.txt" retrieves a text file containing information on becoming a radio amateur.

Note to users with FTP capability: All of these files are also available by anonymous ftp to oak.oakland.edu in the pub/hamradio/arrl/infoserver area. Retrieve the file index.txt in the /league sub-directory for a complete listing of available files.

If you want to retrieve several text files with one message, use a separate line for each "send filename" request.

Your From: field or Reply-to: field in your header should contain a valid Internet address, including full domain name. If your From: field does not contain a valid Internet address, the answer will not reach you. If this is the case, then use the reply command as shown above. When needed, this command should always be the first command in your message.

IMPORTANT: Please use the quit command in your message. This will prevent processing errors from message signatures.

PLEASE NOTE!: This is an automated system not capable of handling written requests. Any questions on the info-server or the content of any of its files should be directed to mtracy@arrl.org.

ALSO NOTE!: Do *NOT* reply to messages sent from info@arrl.org - the reply address is redirected to keep bounced messages from endlessly looping. Write a new message to info@arrl.org instead.

The Technical Information Service gives League members on the internet better access to the knowledgeable technical staff here at ARRL HQ. Questions relating to Amateur Radio and related technical topics are welcome. To use this service, send a normal e-mail message to tis@arrl.org with your question spelled out in plain english. For best service, be as specific as possible and keep your line length in messages to a maximum of 80 characters. Due to personnel limitations, priority will be given to questions from League members.

Best Regards,

Michael Tracy, KC1SX, ARRL Technical Information Services Coordinator
(e-mail mtracy@arrl.org)

Sample of files available from INFO: (There are lots more!)

Note - If you are not yet an Amateur Radio operator retrieve the file prospect (send prospect) for information on how to easily get started in this fun hobby.

FILENAME	SIZE DESCRIPTION
PROSPECT.TXT	2k How to get your Amateur Radio license
EXAMS.TXT	52k Current exam schedule info - updated bi-weekly
EXAMINFO.TXT	9k Examinations - what to bring - requirements
USERS.TXT	6k List of HQ Email addresses
ARRLCAT.TXT	39k Catalog of ARRL Publications - commercial content
JOIN.TXT	2k How become an ARRL member
SERVICES.TXT	5k A condensed list of ARRL membership services
TOUR.TXT	28k An electronic tour of ARRL Headquarters
DIR.HQ	5k Visiting ARRL HQ - directions and tour information
HFBANDS	7k Breakdown of users of HF spectrum
Q-SIGS	1k ARRL list of Amateur Radio Q-signals
W1AW.SKD	2k W1AW schedule of transmissions and operation
PRODREV1.TXT	12k Which rig is best? Part 1 - QST Lab Notes
PRODREV2.TXT	22k Which rig is best? Part 2 - QST Lab Notes
!LIST.TXT	6k QST Bibliographies List
RFIGN.TXT	37k How to solve an EMI/RFI problem - QST Lab Notes
RFISOURC.TXT	13k Where to buy filters - EMI-proof telephones etc.
ADDRESS.TXT	16k Lots and lots of ham/electronic company addresses
KITS.TXT	6k List of companies that sell kits
BBS.TXT	12k List of ham-radio land-line bulletin boards

FAQ1.TXT 25k Introduction to the FAQ and Amateur Radio
FAQ2.TXT 45k Amateur Radio Orgs, Services and Info Sources
FAQ3.TXT 32k Amateur Radio Advanced and Technical Questions

American Radio Relay League, Inc. Tel: 1-203-666-1541
225 Main Street Fax: 1-203-665-7531
Newington, CT 06111 Email: mtracy@arrl.org

Date: Fri, 4 Nov 1994 17:40:16 GMT
From: wwalker@ic1d.harris.com (David Walker)
Subject: Quad Op Amp ??

>Will the LM2900 work the same as the LM3900??

Yes, they are almost exactly the same; the 2900 has a wider temp. range, but electrically they are essentially identical

>What other ideas ??

Sorry, I'm not familiar with the circuit so I can't help there. Good luck!

David WB4DJZ

Date: Thu, 3 Nov 1994 20:08:22 GMT
From: dnewkirk@arrl.org (Dave Newkirk (WJ1Z))
Subject: VCO in Key Components of Mod RCVR Design (QST)

Bill Kirkland (kirkland@bgtys22.bnr.ca) wrote:

: Does anyone have any information on the design of the VCO diagrammed
: in the second part of the series "Key Components of Modern Receiver
: Design"? I am particularly interested in how the 9.2nH coil is tapped and
: any information on the source biasing scheme for the FET oscillator.

One thing's for sure: We relayed that inductor label incorrectly; the correct value is 92 nH.

How about asking the author? The article's Endnote 10 (on page 31 of June 1994 *QST*) includes the phone (201-881-1200) and fax (201-881-8361) numbers for Compact Software, of which author Ulrich Rohde is president.

David Newkirk, WJ1Z dnewkirk@arrl.org

Date: 3 Nov 1994 22:51:58 -0800
From: daustin@solano.community.net (Dave Austin)
Subject: Video Id'er . need info.

Am looking into getting one of those video id boards. Was wondering if it can put out black and white . Looks like it just does white. I wanted to make a id that you can kind of see through. But would need both b and w. Easy to modify one. The Elktronics is the only one I know about. Has anyone fooled with this?

TNX
Dave

Date: Fri, 4 Nov 1994 15:55:50 GMT
From: phb@syseng1.melpar.esys.com (Paul H. Bock)
Subject: Where can I find a grid dip meter?

richer@cambridge.village.com (Al Richer) writes:

>Hello!

>After a hiatus of more years than I care to think about, I have returned to
>ham radio and construction of ham goodies. Unfortunately, I no longer own
>a grid-dip meter, and I can't seem to find one of the damned things anywhere.
>It's makin' it real hard to align converters....

>Can anyone tell me where I can purchase one of hese devices, or better yet,
>can someone point me toward a set of plans for same? I would prefer to build
>it myself, being the cheap swine that I am.....<grin>...

> Al Richer

And please *post* the info rather than e-mailing to Al; I'd like the info also, and there are no doubt others as well.

73,

Paul, K4MSG

Date: 3 Nov 1994 08:47:54 -0500
From: richer@cambridge.village.com (Al Richer)
Subject: Where can I find a grid dip meter?

Hello!

After a hiatus of more years than I care to think about, I have returned to ham radio and construction of ham goodies. Unfortunately, I no longer own a grid-dip meter, and I can't seem to find one of the damned things anywhere. It's makin' it real hard to align converters....

Can anyone tell me where I can purchase one of these devices, or better yet, can someone point me toward a set of plans for same? I would prefer to build it myself, being the cheap swine that I am.....<grin>...

Al Richer

Date: 4 Nov 1994 17:22:40 GMT
From: Cecil_A_Moore@ccm.ch.intel.com
Subject: Where does the power go

In article <1994Nov3.025729.14375@ke4zv.atl.ga.us>, Gary Coffman <gary@ke4zv.atl.ga.us> wrote:
>In article <3998nm\$c4c@sunb.ocs.mq.edu.au> guy@macadam.mpce.mq.edu.au (Guy Fletcher) writes:

>>

>>This is a rather different way of looking at the question,
>>hence the new thread. Considered comments welcome.

>

>If I may summarize, real power always flows
>towards the load, any heating in the amplifier is the result of
>loss of efficiency due to a poor load impedance at the amplifier
>output terminals. All else is chimera.

Hi Gary, unfortunately I can't find and don't remember Guy Flet's different way of looking at things article that you quoted.

When I was in college, I ran an ARC-5 transmitter on 40m. It had two 1625 tubes. I turned it on one day and didn't know that my antenna had fallen in a storm shorting the coax at the feed point. I had no SWR meter. I listened, heard no signals, and started sending CQ. The parasitic suppressors started smoking and the plates turned red.

If my 75 ohm coax had been infinitely long, I would not have known any difference. The transmitter would have seen the normal 75 ohm load and it did actually see that 75 ohm load for an instant until the reflections from the short got back to the transmitter. If the impedance looking back into the transmitter were zero or infinite, the tubes would not have gotten hot. Therefore, there must be a real resistive component that caused a real

I2R loss within the tubes solely because of the reflections.

It helps to first visualize a perfect half wave dipole, ie purely resistive with no reflections, and then imagine an irate neighbor driving a nail through your coax exactly one half wavelength from the transmitter. The resulting reflections are partially re-reflected and partially absorbed by a real resistive component and dissipated within the transmitter tubes. Eventually, all the power not dissipated in the coax will be dissipated by the only "load" left in the system.

--

73, Cecil, KG7BK, 00TC (All my own personal fuzzy logic, not Intel's)

Date: 5 Nov 1994 07:12:13 GMT

From: little@iamu.chi.dec.com (Todd Little)

References<3 <CynHwp.FCq@freenet.buffalo.edu>,

<bodafu.681.001D6896@ccvax.sinica.edu.tw>

Reply-To: little@iamu.chi.dec.com (Todd Little)

Subject: Re: THE LITTLE RAZOR BLADE RADIO (UPDATE)

How do you find the sensitivity of your radio? I built one and find that it isn't very sensitive and can't get it to tune anything other than the loudest local station. I'm guessing that both problems may be attributable to using a low impedance earphone (all I had handy). My assumption is that the low impedance earphone lowers the Q so much of the circuit that it is so broadbanded as to receive just about anything.

Does anyone know of a good source for inexpensive high impedance earphones? I need about 20 of them for the radio club at the local elementary school. I'm going to have them build one of these radios as a first project.

73,
Todd
N9MWB

Date: Fri, 4 Nov 1994 07:50:15 +8

From: bodafu@ccvax.sinica.edu.tw (David L. Bergart)

References<1994Oct30.045752.13121@ke4zv.atl.ga.us> <3,

<CynHwp.FCq@freenet.buffalo.edu>

Subject: Re: THE LITTLE RAZOR BLADE RADIO (UPDATE)

>Sure you could make some lead sulfide by the method you describe... but,
>would it be galena! Would it work as a detector ? ... did you try it ?

Yup, sure does. I must admit, though, that after I went to the trouble of making galena, and gloating about what a good boy I was, I went back to using store-bought diodes---much easier to use, and I am REAL lazy.

David

____D__a__v__i__d____B__e__r__g__a__r__t_____
bodafu@ccvax.sinica.edu.tw

End of Ham-Homebrew Digest V94 #326
